

Land Surface Temperature Measured by ASTER and MODIS - First Results

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At the end of 1999 NASA launched the Terra Satellite. The satellite included two instruments designed to measure the land surface temperature. These instruments were the Moderate Resolution Imaging Spectroradiometer (MODIS) and the Advanced Spaceborne Thermal Emission Reflectance Radiometer (ASTER). The MODIS instrument is designed for global monitoring and has coarse spatial resolution in the thermal infrared (1km) and frequent global coverage (daily) while the ASTER instrument is designed for local scale studies and has high spatial resolution in the thermal infrared (90m) and infrequent global coverage (yearly). Both instruments have several channels in the thermal infrared part of the spectrum (8-12 micrometers) providing simultaneous information on land surface temperature at multiple scales.

During the first year of the mission the primary focus has been on the determination of the accuracy and precision of the radiances measured by the instruments as well as the products, such as land surface temperature, derived from those radiances. In order to determine the accuracy and precision of the data a set of land test sites was established in North America and Australia. The sites are located at Lake Tahoe, CA, USA, Uardry, NSW, Australia, Amburla, NT, Australia and Thangoo, WA, Australia. Multiple measurements of the surface radiance and temperature are made at these test sites on a near continuous basis (every 2 minutes). These data coupled with additional atmospheric measurements allow the prediction of the satellite radiance for comparison with the measured radiance as well comparison of the in-situ temperatures with the satellite derived temperatures at the different measurement scales of the two instruments. We will provide some initial results from these comparisons and an assessment of the accuracy and precision of the satellite radiances and products derived from them.

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